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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/730,461	12/05/2000	Hiroshi Kawai	P/1071-1207	8149

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EXAMINER
BELLAMY, TAMIKO D

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 09/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/730,461	Applicant(s) KAWAI, HIROSHI
	Examiner Tamiko D. Bellamy	Art Unit 2856

-- Th MAILING DATE of this communication app ars on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 December 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

1. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (5,780,740).

As to claim 1, Lee et al. discloses in Figs. 8A and 8B a resonant element 100 comprising a vibrating body 105 vibratable in orthogonal X and Z direction (col. 8, line 58, col. 9, lines 25-37), excitation means 106, 110 for causing said vibrating body 105 to be subjected to an excitation vibration in the X-direction (col. 9, lines 21-24), an excitation deflection detecting means 111 for detecting any deflection of said vibrating body 105 in the Z-direction during the excitation vibration thereof in the X-direction (col. 10, lines 7-16), and excitation deflection inhibiting means for inhibiting the deflection of said vibrating body in the Z-direction (col. 9, lines 55-65).

As to claim 2, Lee et al. discloses in Figs. 8A and 8B an angular velocity sensor for detecting the angular velocity around the Y-axis (col. 9, lines 25-34), an excitation deflection detecting means 111 also serves as Z-direction vibration detecting means (col. 10, lines 7-16).

As to claim 3, Lee et al. discloses in Figs. 8A and 8B an excitation deflection means constituting of a detecting electrode 111 with respect to said vibrating body 105 in response to a vibration or deflection thereof in the Z-direction (col. 10, lines 7-16).

As to claims 4 and 5, Lee et al. discloses in Fig 8A a vibration body 105 that is disposed so as to be opposed to a plane in the X-Y directions of a fixed substrate 101 (col. 9, lines 35-38).

As to claim 6, Lee et al. discloses in Fig. 8A a vibrating body 105 that is electrically conductive (col. 9, lines 3-4).

As to claim 7, Lee et al. discloses in Figs. 8A and 8B a vibrating body 105 disclosed above a fixed substrate 101 and a detection electrode 111 disposed on surface of fixed substrate 101 (col. 10, lines 7-16).

As to claim 8, Lee et al. discloses in Figs. 8A and 8B a detection electrode 111 disposed in a cavity in said fixed substrate 101 below said vibrating body 105 (col. 10, lines 7-15). Lee et al. discloses that the detection electrode is below the vibrating body. Therefore, by placing the detecting electrode between the vibrating body 105 and the substrate 101, the space between elements 105 and 101 inherently forms a cavity as claimed.

2. Claim1 is rejected under 35 U.S.C. 102(e) as being anticipated by Kawai et al. (6,430,998).

As to claim 1, Kawai et al. discloses an vibrating body 10, an exciting means 11 A causing said vibrating body to be subjected to an excitation vibration in the X-direction

(col. 1, lines 20-34). As one well know in the skill of the art, knows that by changing the axis of rotation of cited art produces an sensor element that functions in the same manor of detecting deflections of vibrations along the X and Z-directions as claimed.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (5,780,740) in view of Yamashita et al. (5,952,572).

As to claims 9,12, 13, and 15, Lee et al. discloses in Figs. 8A and 8B an angular velocity sensor 100 comprising an excitation deflection detecting means including a detecting electrode 111 for detecting variation in an electrostatic capacity (with respect to said vibrating body in response to a deflection thereof in the Z-direction (col. 10, lines 7-16).

As to claim 10, Lee et al. discloses in Figs. 8A and 8B an angular velocity detector 100 wherein vibrating body 105 is rotatable about the Y-axis orthogonal to said X- and Z-directions (col. 9, lines 25-34).

Lee et al. does not clearly disclose a capacity-voltage converting means for converting the variation in the electrostatic capacity by said detecting electrode into a voltage (cl. 9), and a capacity-voltage converting means comprising a FET (cls.11 and 14). However, Lee et al. does make use of the Z-axis directional displacement being measured by variations in capacitance

generated in the detecting electrode 111 (col. 9, lines 15-21, col. 10, lines 7-16). It would have been obvious at the time the inventions was made to a person having ordinary skill in the art to modify Lee et al. to include a capacity-voltage converting means for converting the variation in the electrostatic capacity by said detecting electrode into a voltage for the purpose of providing a angular sensor that is capable of measuring deflection in the Z-direction displacement according to variations in voltage.

As to claims 9, Yamashita et al discloses a capacity-voltage converting means for converting the variation in the electrostatic capacity by said detecting electrode 112a into a voltage (col. 10, lines 40-53).

As to claims 11 and 14, Yamashita et al. discloses an angular rate sensor and acceleration sensor (title) capacity-voltage converting means comprises a FET (col. 10, lines 40-56). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify Lee et al. in the view of Yamashita et al., to use a capacity-voltage converting means including a FET for the purpose of detecting capacitance changes of all capacitors as voltage changes (col. 10, lines 40-52).

Conclusion

5. The following patent cited to further show the state of the art with respect to angular sensor detecting deflections of vibrations in the Z-direction.

U.S. Pat. N.o. 5,894,091 to Kubota.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tamiko D. Bellamy whose telephone number is (703) 305-4971. The examiner can normally be reached on Monday through Friday 8:30 AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (703) 305-4705. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Tamiko Bellamy
T.B.
September 18, 2002

HEZRON WILLIAMS
SUPERVISORY PATENT EXAMINER
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